

Bob O'Dette

Division of Water Resources

Serena Broska

***Division of Solid Waste
Management***

TN

Department of
**Environment &
Conservation**

LAND APPLICATION REQUIREMENTS



FOR
**RESIDUALS WITH
PATHOGENS AND VECTORS**



It's Great to be in

























GUARDS IN PLACE

CAUTION
DO NOT REACH
INTO RUNNING
EQUIPMENT
CAUTION
AUTOMATIC
EQUIPMENT

CAUTION
DO NOT
REACH
INTO
EQUIPMENT



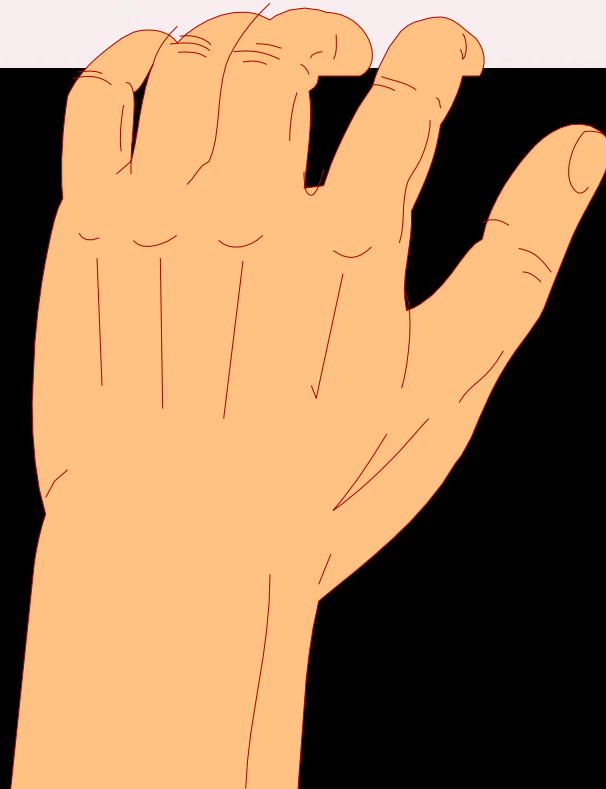




It's Starting To Get Deep



In Some Places



Residuals

in

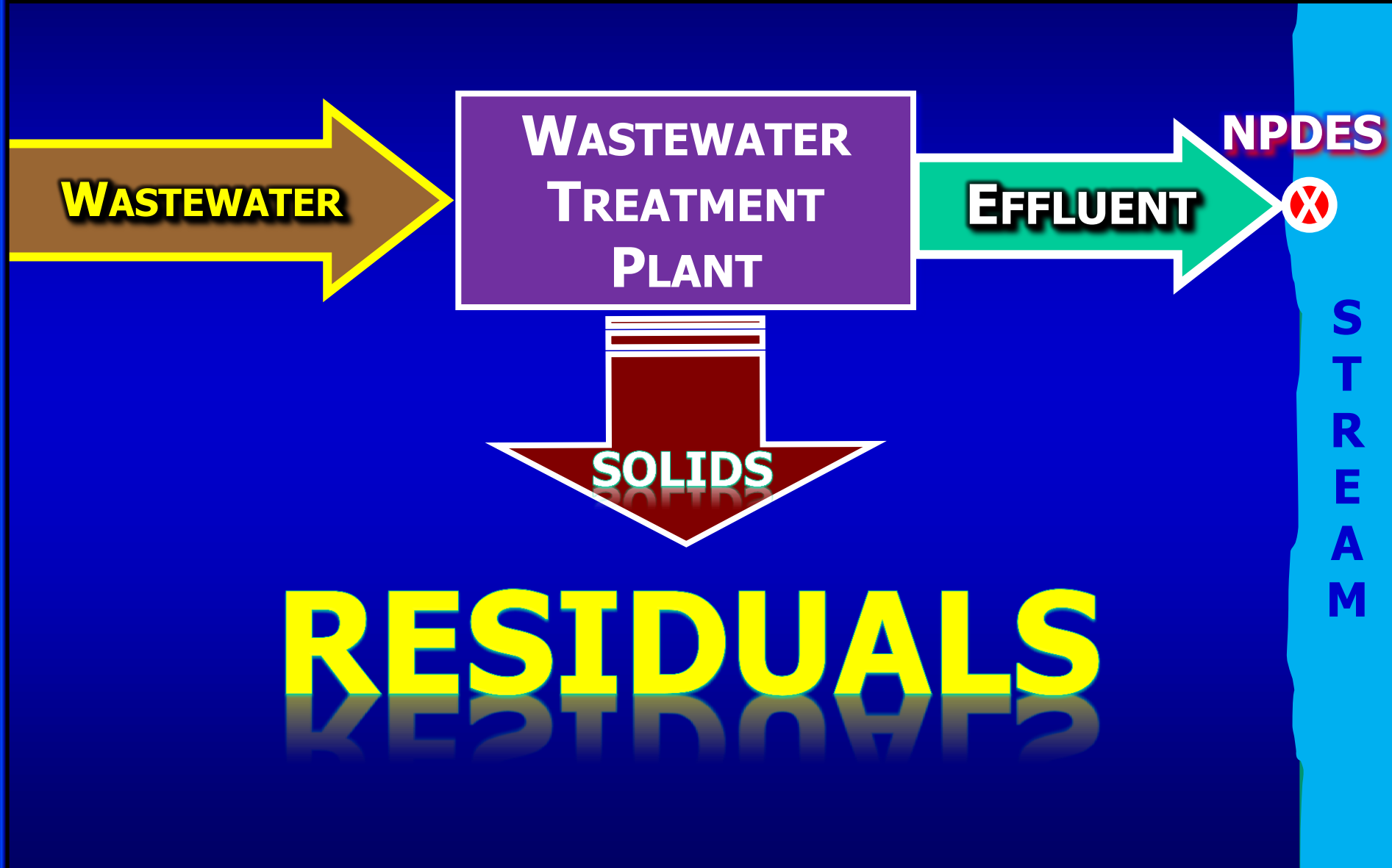
Tennessee



RESIDUALS

By-products of
wastewater treatment
during the solids-liquid
separation process, aka
“wastewater solids” or
“sludge”.

Typical Wastewater Treatment Plant



LAWS, RULES & REGULATIONS



R C R A
C W A



40 CFR Part 257
40 CFR Part 503



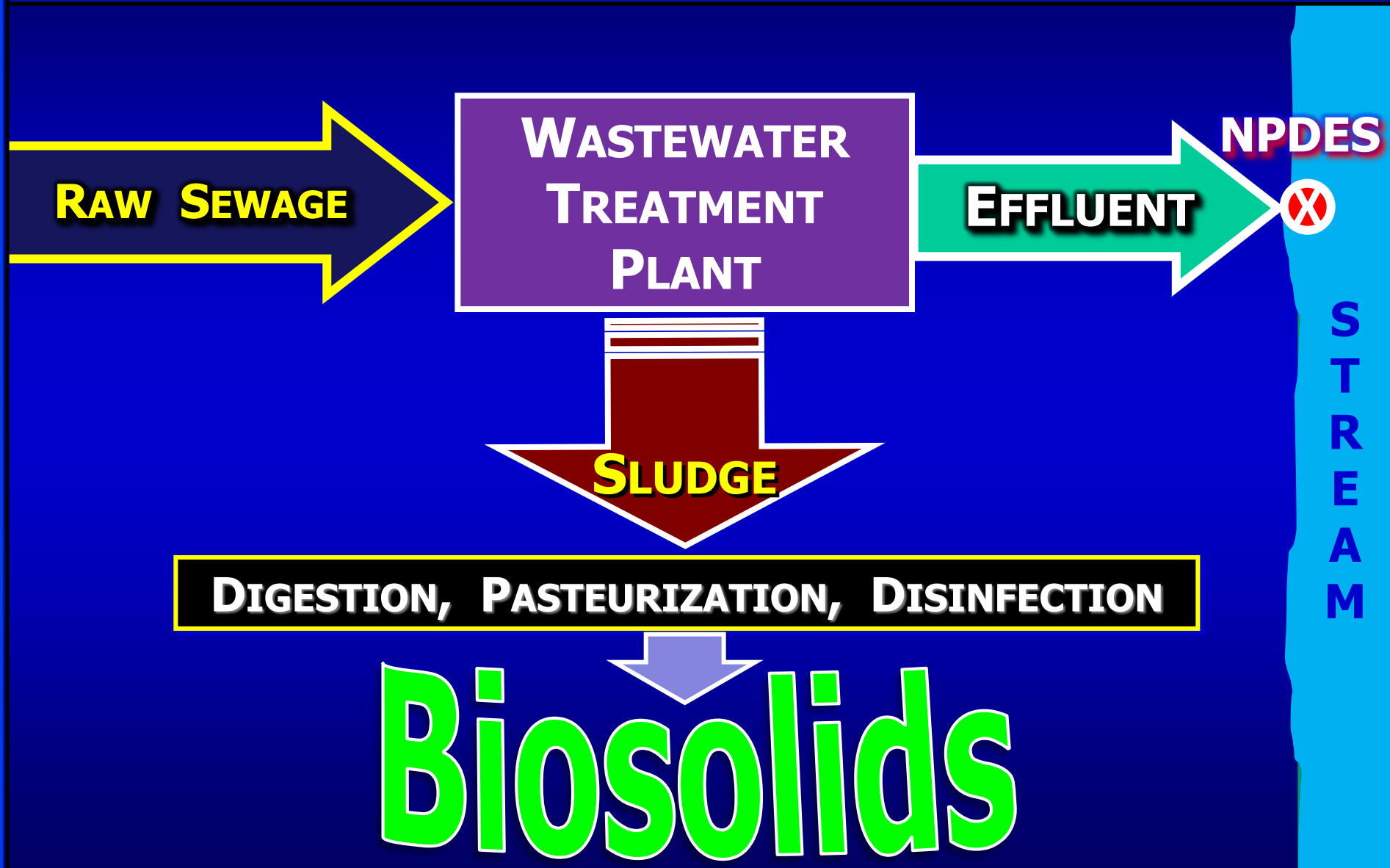
Thursday
September 13, 1979

Environmental Protection Agency

**Criteria for Classification of Solid Waste
Disposal Facilities and Practices; Final,
Interim Final, and Proposed Regulations (as
corrected in the Federal Register of
September 21, 1979)**



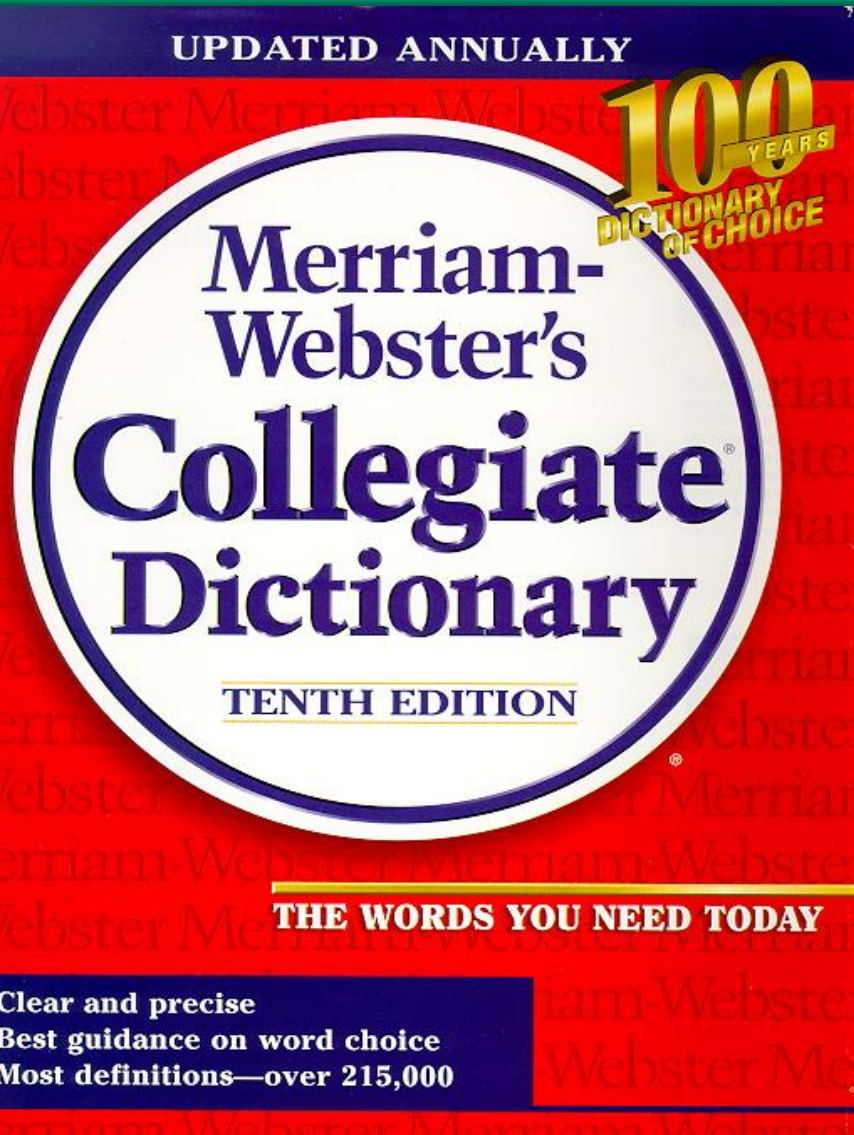
Typical Wastewater Treatment Plant



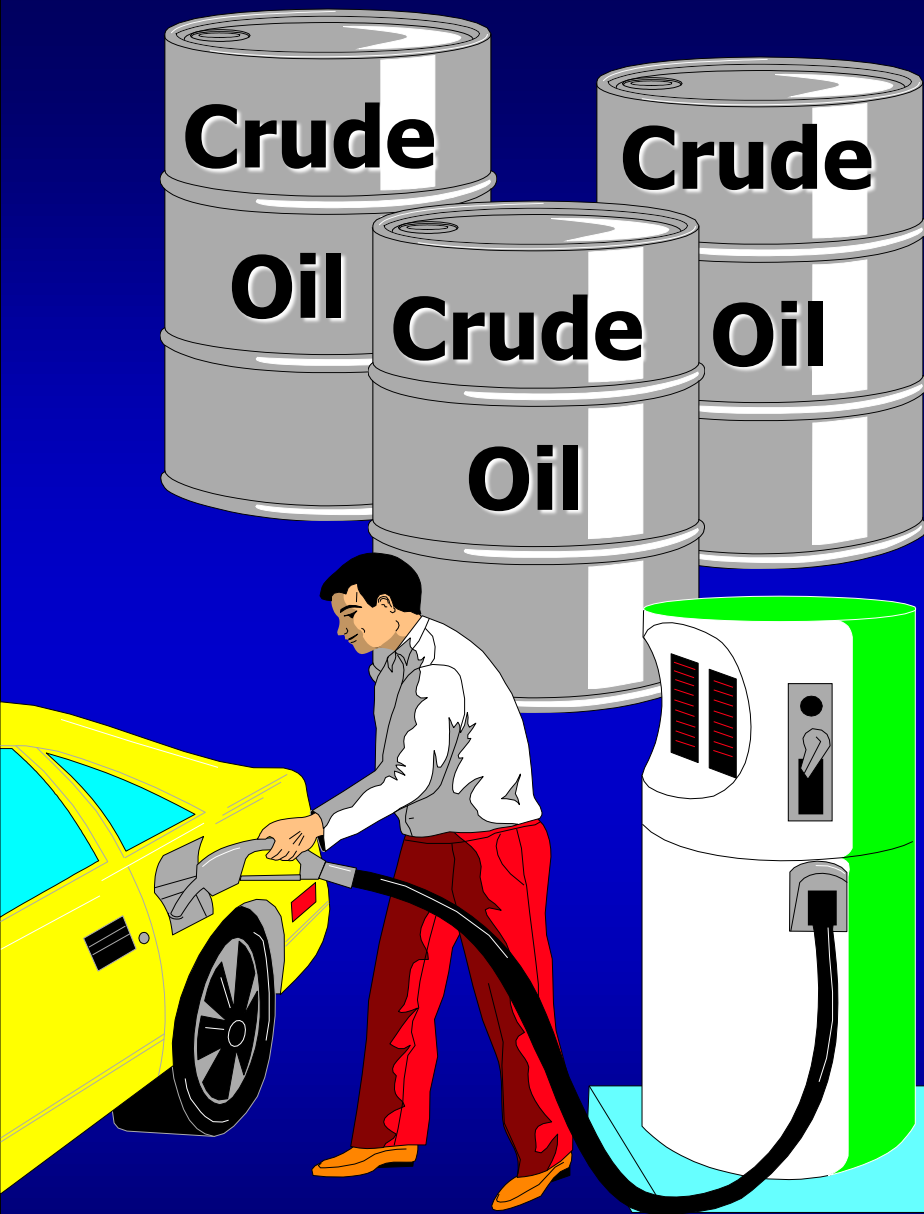
BIOSOLIDS

Biosolids

DEFINITION

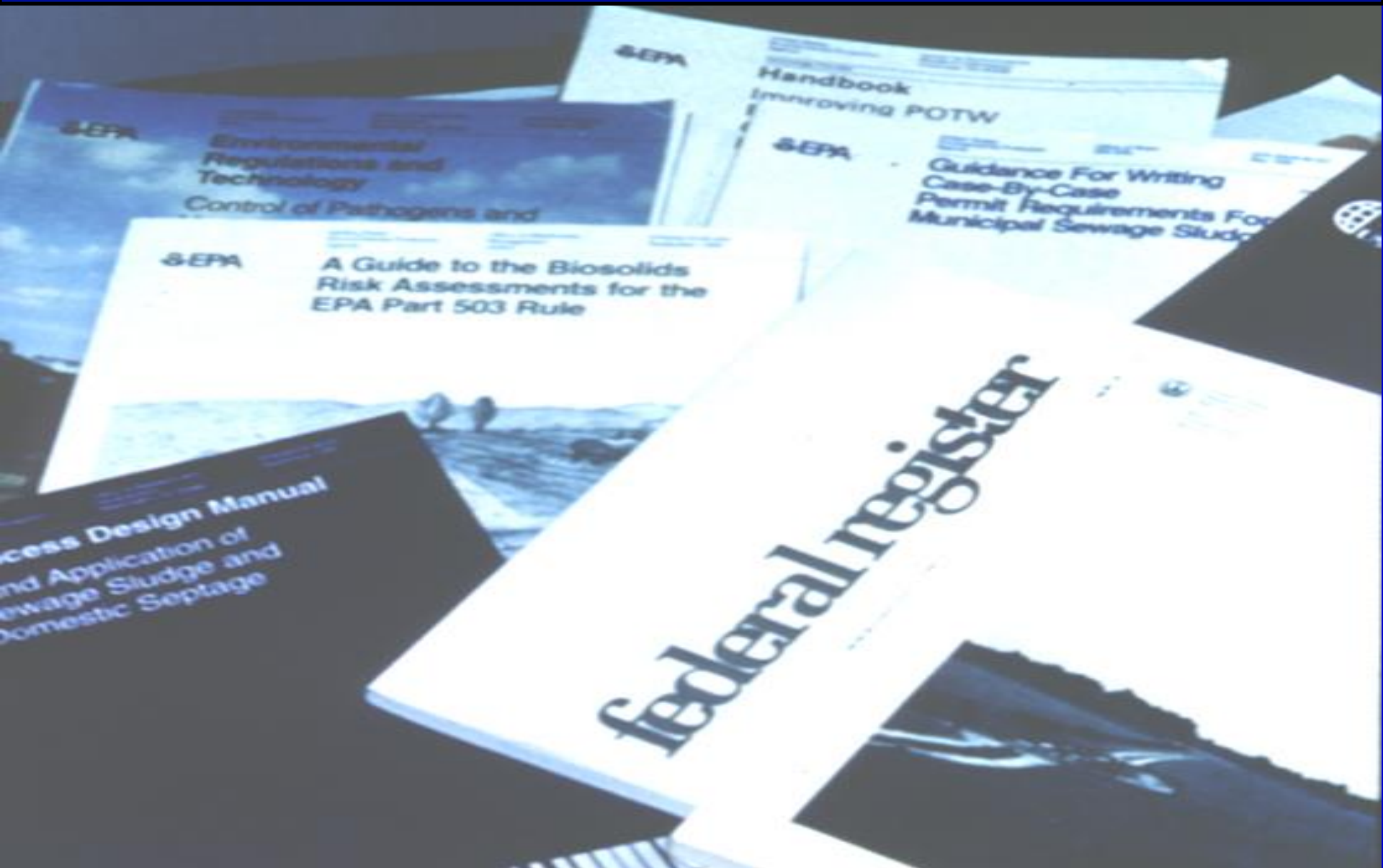


solid organic
matter
recovered from
a sewage
treatment
process and
used **esp.** as
fertilizer.

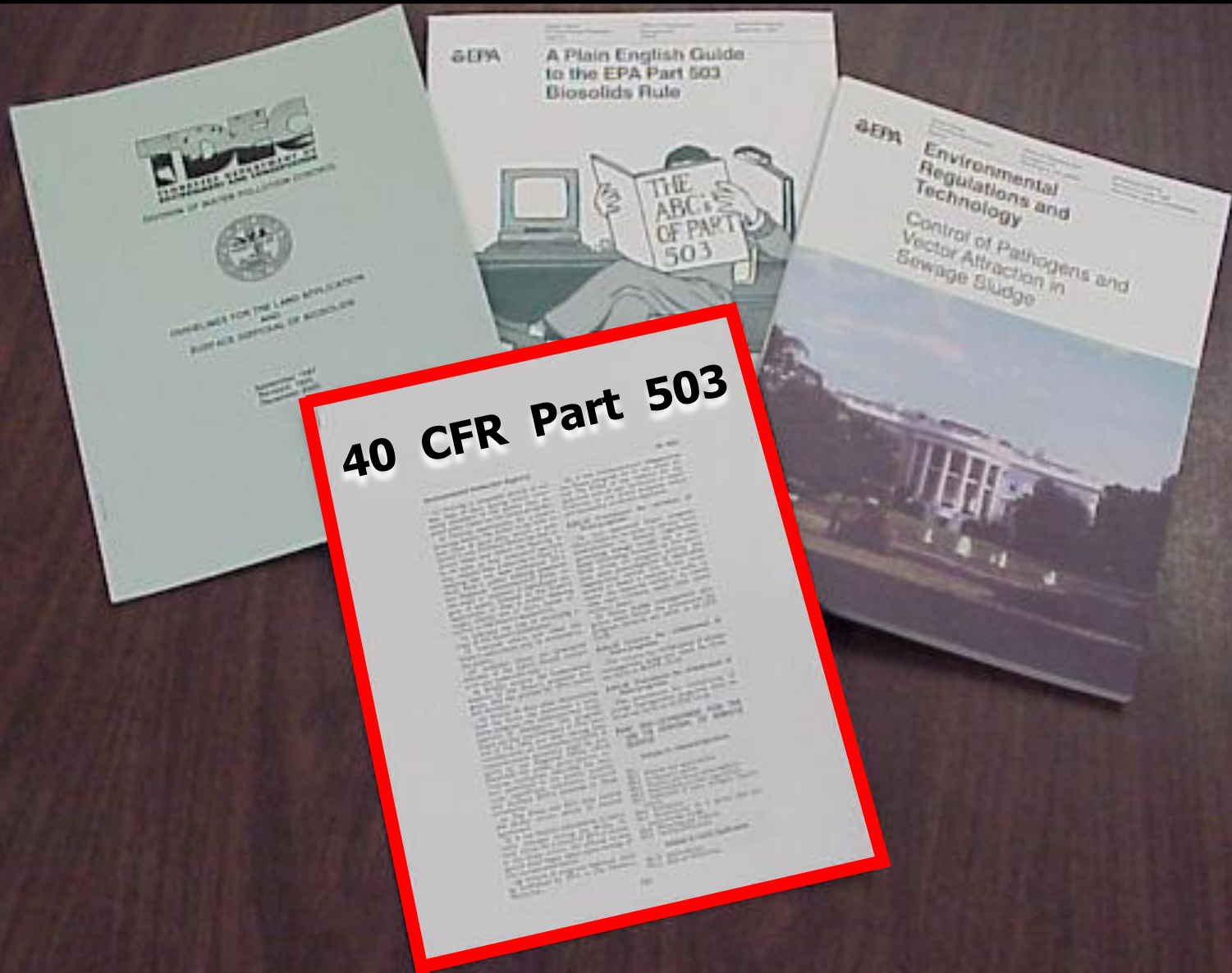


Biosolids
are no more
Sludge
than
Gasoline
is
Crude Oil

Rules and Guidance Documents



Rules and Guidance Documents



federal register

Friday
February 19, 1993

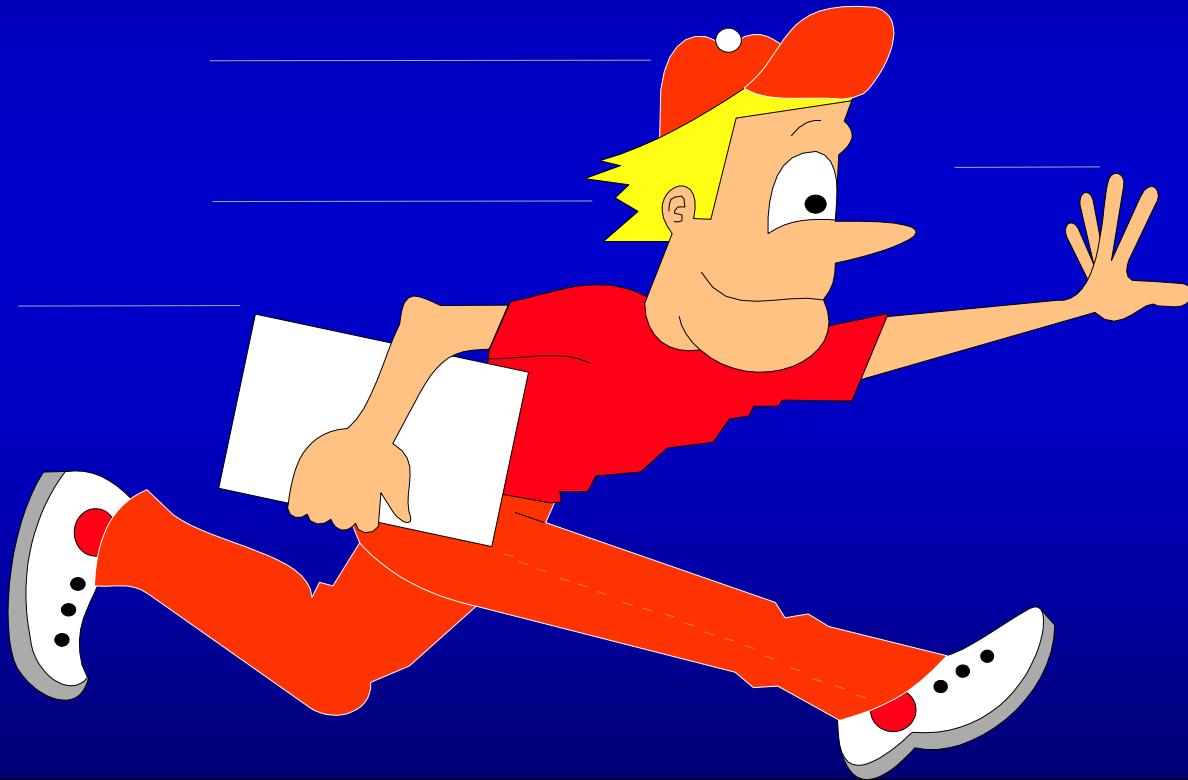
Part II

Environmental Protection Agency

40 CFR Part 257 et al.
Standards for the Use or Disposal of
Sewage Sludge; Final Rules

40 CFR Part 503

⇒ *Self - implementing*



Clean Water Act

Section 405

(f) Implementation of Regulations. -

(1) Through Section 402 Permits. – Any permit issued under section 402 of this Act to a publicly owned treatment works or any other treatment works treating domestic sewage shall include requirements for the use and disposal of sludge that implement the regulations established pursuant to subsection **(d)** of this section.

C. SLUDGE MANAGEMENT PRACTICES

1. The permittee must comply with 40 CFR 503 et seq. Sludge shall be sampled and analyzed at a frequency dependant both on the amount of sludge generated annually and on the disposal practice utilized. Whenever sampling and analysis are required by 40 CFR 503, the permittee shall report to the division the quantitative data for the following parameters:

1) Arsenic	7) Nickel
2) Cadmium	8) Selenium
3) Copper	9) Zinc
4) Lead	10) Nitrite plus Nitrate, NO ₂ , + NO ₃ as N
5) Mercury	11) Total Kjeldahl Nitrogen, as N
6) Molybdenum	12) Ammonia, NH ₃ , as N

This sludge analysis must be submitted by February 19th of each calendar year. This information shall be submitted to the Division of Water Pollution Control, Central Office, 401 Church Street, 6th Floor Annex, Nashville TN 37243-1534, Attention: Sludge Coordinator, Municipal Facilities Section.

2. Land application of sludge shall halt immediately if any of the following concentrations are exceeded:

POLLUTANT	CONCENTRATION (mg/kg ¹)
Arsenic	75
Cadmium	85
Zinc	7500
Copper	4300
Lead	840

POLLUTANT	CONCENTRATION (mg/kg ¹)
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100

1 Dry Weight Basis

- a) Monthly average pollutant concentrations shall not exceed Table 3 of 40 CFR §503.13. If they are exceeded cumulative pollutant loading rates are to be calculated and recorded and shall not exceed Table 2 of 40 CFR §503.13 for the life of the land application site.
3. If land application is the final disposition of the wasted sludge, the permittee shall provide pathogen reduction, sludge stabilization and comply with land and crop usage controls as listed in 40 CFR Part 503, as authorized by the Clean Water Act. Records must be maintained by the permittee that indicate compliance or non-compliance with this rule. If the permittee is required to report to EPA, copies of all reports should be sent to the division, at the address listed in paragraph 1 of this section.

NPDES Permits In Tennessee

All sludge and/or biosolids use or disposal must comply with 40 CFR 503 et seq. Biosolids shall be sampled and analyzed at a frequency dependent on the amount used annually.

Any facility that land applies non-exceptional quality biosolids must obtain an appropriate permit from the division in accordance with Chapter 0400-40-15.

- a. Reopener: If an applicable "acceptable management practice" or numerical limitation for pollutants in sewage sludge promulgated under Section 405(d)(2) of the Clean Water Act, as amended by the Water Quality Act of 1987, is more stringent than the sludge pollutant limit or acceptable management practice in this permit, or controls a pollutant not limited in this permit, this permit shall be promptly modified or revoked and reissued to conform to the requirements promulgated under Section 405(d)(2). The permittee shall comply with the limitations by no later than the compliance deadline specified in the applicable regulations as required by Section 405(d)(2) of the Clean Water Act.
- b. Notice of change in sludge disposal practice: The permittee shall give prior notice to the director of any change planned in the permittee's sludge disposal practice.

503 Subparts

A

General Provisions

B

Land Application

C

Surface Disposal

D

Pathogens and Vectors

E

Incineration

Relationship to other Regulations

503.4

**Disposal in a solid waste
landfill that complies with
40 CFR Part 258
constitutes compliance with
Section 405(d) of the CWA.**

40 CFR Part . . .

Environmental Regulations

122-124 NPDES

257 Solid Waste

258 Municipal Solid Waste

403 Pretreatment

501 Biosolids Management

503 Biosolids



Friday
February 19, 1993

**Friday
February 19, 1993**

Environmental Protection Agency

40 CFR Part 257 et al.

**Standards for the Use or Disposal of
Sewage Sludge; Final Rules**



**ENVIRONMENTAL PROTECTION
AGENCY****40 CFR Parts 257, 403 and 503****[FRL-4203-3]****Standards for the Use or Disposal of
Sewage Sludge****AGENCY:** Environmental Protection
Agency.**ACTION:** Final rule.

40 CFR Part 503

(w) *Sewage sludge* is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.

40 CFR Part 257

Sewage sludge means solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.

Tennessee Biosolids Rules

Chapter 0400-40-15

New Rules

Chapter 0400-40-15 Biosolids Management

Table of Contents

0400-40-15-.01 General Provisions
0400-40-15-.02 Land Application
0400-40-15-.03 Surface Disposal
0400-40-15-.04 Pathogens and Vector Attraction Reduction
0400-40-15-.05 Reserved
0400-40-15-.06 Permitting
0400-40-15-.07 Fees

0400-40-15-.01 General Provisions [40 CFR 503 Subpart A]

(1) Purpose and Applicability [40 CFR 503.1]

(a) Purpose

1. These Rules establish standards, which consist of general requirements, contaminant limits, management practices, and operational standards, for the final application or disposal of biosolids and sewage sludge generated during the treatment of domestic sewage in a wastewater treatment works. Standards are included in these Rules for biosolids and sewage sludge applied to the land or placed on a surface disposal site. Also included in these Rules are pathogen and alternative vector attraction reduction requirements for biosolids and sewage sludge applied to the land or placed on a surface disposal site.

Chapter

0400-40-15

JUNE 2013						
SUN	MON	TUE	WED	THU	FRI	SAT
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

**Effective
Date**

June 30, 2013



State Rules
(0400-40-15)

*are a mirror
image of*

**Federal
Regulations**
(40 CFR Part 503)



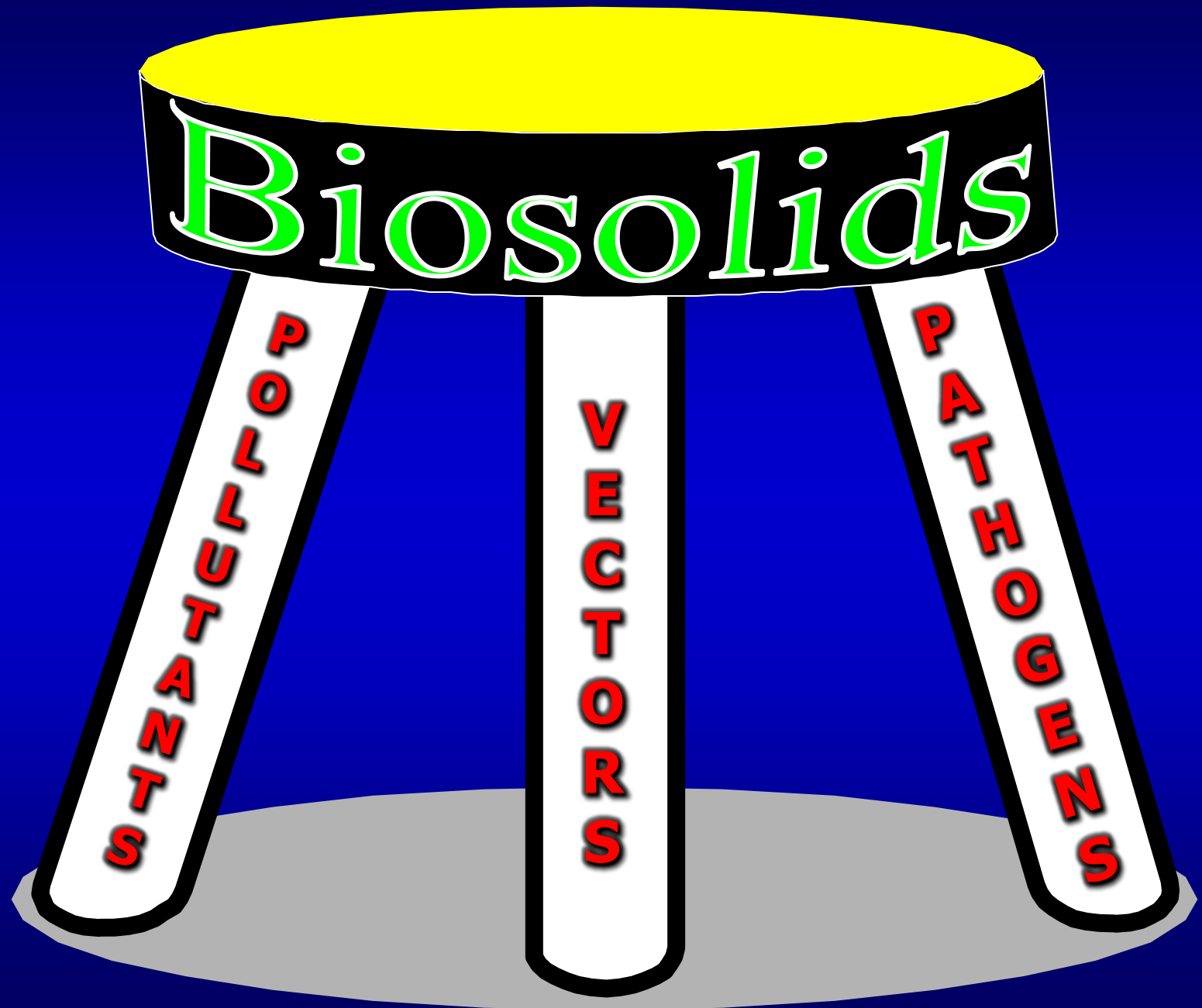
STANDARDS

Pollutants

Pathogens

Vector

Attraction





503

Vector Attraction Reduction

Vector Attraction Reduction VAR



Vectors

Birds, Rodents, Insects – may pick up the biosolids particles and move them to a different location.

Vectors are not attracted to biosolids that are stable (highly digested), high in pH, extremely dry, injected or incorporated.

Summary of Options for Vector Attraction Reduction

- 1. 38% volatile solids reduction.**
- 2. Bench test for Anaerobic digestion**
- 3. Bench test for Aerobic digestion**
- 4. Specific Oxygen Uptake Rate (SOUR)**
- 5. Aerobic processes at greater than 40°C for 14 days or longer (Composting).**
- 6. Alkali (Alkaline) additions under specified conditions.**

Summary of Options for Vector Attraction Reduction

- 7. Dry biosolids with no unstabilized solids to at least 75% solids.**
- 8. Dry biosolids with unstablized solids to at least 90% solids.**
- 9. Inject biosolids beneath the soil surface.**
- 10. Incorporate biosolids into the soil within 6 hours of application.**
- 11. Cover biosolids placed on a surface disposal site with soil or other material at the end of each operating day (Surface Disposal only).**
- 12. Alkaline treatment of domestic septage to pH 12 or above for 30 minutes without adding more alkaline material.**



503

P a t h o g e n R e d u c t i o n

Pathogen Reduction

503.32

Class **A** Biosolids

- *Pathogens of Concern are Below Detection*
- *No Site Restrictions*

Class **B** Biosolids

- *At least 2-log reduction of Fecal Coliform*
- *Class B + Site Restrictions =
Class A level of protection*

Class A Pathogen Reduction Alternatives

- 1. Thermal Treatment**
- 2. High pH – High Temperature**
- 3. Testing before and after process**
- 4. Testing Final Biosolids Product**
- 5. P F R P processes**
- 6. Processes Equivalent to P F R P**

Processes to Further Reduce Pathogens (P F R P)

Listed in Appendix B of 40 CFR Part 503

- 1. Composting**
- 2. Heat Drying**
- 3. Heat Treatment**
- 4. Thermophilic
Aerobic Digestion**
- 5. Beta Ray Irradiation**
- 6. Gamma Ray Irradiation**
- 7. Pasteurization**

P F R P's

*Originated with
40 CFR Part 257.*

PROCESSES TO FURTHER REDUCE PATHOGENS (PFRP)

Composting: Using the within-vessel composting method, the solid waste is maintained at operating conditions of 55 °C or greater for three days. Using the static aerated pile composting method, the solid waste is maintained at operating conditions of 55 °C or greater for three days. Using the windrow composting method, the solid waste attains a temperature of 55 °C or greater for at least 15 days during the composting period. Also, during the high temperature period, there will be a minimum of five turnings of the windrow.

Heat drying: Dewatered sludge cake is dried by direct or indirect contact with hot gases, and moisture content is reduced to 10 percent or lower. Sludge particles reach temperatures well in excess of 80 °C, or the wet bulb temperature of the gas stream in contact with the sludge at the point where it leaves the dryer is in excess of 80 °C.

Heat treatment: Liquid sludge is heated to temperatures of 180 °C for 30 minutes.

Thermophilic Aerobic Digestion: Liquid sludge is agitated with air or oxygen to maintain aerobic conditions at residence times of 10 days at 55-60 °C, with a volatile solids reduction of at least 38 percent.

Other methods: Other methods or operating conditions may be acceptable if pathogens and vector attraction of the waste (volatile solids) are reduced to an extent equivalent to the reduction achieved by any of the above methods.

Any of the processes listed below, if added to the processes described in Section A above, further reduce pathogens. Because the processes listed below, on their own, do not reduce the attraction of disease vectors, they are only add-on in nature.

Beta ray irradiation: Sludge is irradiated with beta rays from an accelerator at dosages of at least 1.0 megarad at room temperature (ca. 20 °C).

Gamma ray irradiation: Sludge is irradiated with gamma rays from certain isotopes, such as ⁶⁰Cobalt and ¹³⁷Cesium, at dosages of at least 1.0 megarad at room temperature (ca. 20 °C).

Pasteurization: Sludge is maintained for at least 30 minutes at a minimum temperature of 70 °C.

Other methods: Other methods or operating conditions may be acceptable if pathogens are reduced to an extent equivalent to the reduction achieved by any of the above add-on methods.

Class B Pathogen Reduction Alternatives

1. Monitoring of Indicator Organisms

Test for fecal coliform density - the geometric mean of seven samples shall be less than 2 million MPNs per gram per total solids or less than 2 million CFUs per gram of total solids.

2. P S R P processes

3. Processes Equivalent to P S R P

Processes to Significantly Reduce Pathogens (P S R P)

Listed in Appendix B of 40 CFR Part 503

- 1. Aerobic Digestion**
- 2. Air Drying**
- 3. Anaerobic Digestion**
- 4. Composting**
- 5. Lime Stabilization**

P S R P's

*Originated with
40 CFR Part 257.*

**Pathogen Density
Testing is not
required.**

Site Restrictions

PROCESSES TO SIGNIFICANTLY REDUCE PATHOGENS (PSRP)

Aerobic digestion: The process is conducted by agitating sludge with air or oxygen to maintain aerobic conditions at residence times ranging from 60 days at 15 °C to 40 days at 20 °C, with a volatile solids reduction of at least 38 percent.

Air Drying: Liquid sludge is allowed to drain and/or dry on under-drained sand beds, or paved or unpaved basins in which the sludge is at a depth of nine inches. A minimum of three months is needed, two months of which temperatures average on a daily basis above 0 °C.

Anaerobic digestion: The process is conducted in the absence of air at residence times ranging from 60 days at 20 °C to 15 days at 35 to 55 °C, with a volatile solids reduction of at least 38 percent.

Composting: Using the within-vessel, static aerated pile or windrow composting methods, the solid waste is maintained at minimum operating conditions of 40 °C for 5 days. For four hours during this period the temperature exceeds 55 °C.

Lime Stabilization: Sufficient lime is added to produce a pH of 12 after 2 hours of contact.

Other methods: Other methods or operating conditions may be acceptable if pathogens and vector attraction of the waste (volatile solids) are reduced to an extent equivalent to the reduction achieved by any of the above methods.

APPENDIX II TO PART 257

A. Processes To Significantly Reduce Pathogens

Aerobic digestion: The process is conducted by agitating sludge with air or oxygen to maintain aerobic conditions at residence times ranging from 60 days at 15 °C to 40 days at 20 °C, with a volatile solids reduction of at least 38 percent.

Air Drying: Liquid sludge is allowed to drain and/or dry on under-drained sand beds, or paved or unpaved basins in which the sludge is at a depth of nine inches. A minimum of three months is needed, two months of which temperatures average on a daily basis above 0 °C.

Anaerobic digestion: The process is conducted in the absence of air at residence times ranging from 60 days at 20 °C to 15 days at 35 to 55 °C, with a volatile solids reduction of at least 38 percent.

APPENDIX B TO PART 503—PATHOGEN TREATMENT PROCESSES

A. Processes To Significantly Reduce Pathogens (PSRP)

1. Aerobic digestion—Sewage sludge is agitated with air or oxygen to maintain aerobic conditions for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 40 days at 20 degrees Celsius and 60 days at 15 degrees Celsius.

2. Air drying—Sewage sludge is dried on sand beds or on paved or unpaved basins. The sewage sludge dries for a minimum of three months. During two of the three months, the ambient average daily temperature is above zero degrees Celsius.

3. Anaerobic digestion—Sewage sludge is treated in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35 to 55 degrees Celsius and 60 days at 20 degrees Celsius.

Class B Site Restrictions

for harvesting of crops and turf

- 1. Food crops, feed crops and fiber crops, whose edible parts do not touch the surface of the soil, shall not be harvested until **30** days after biosolids application.**
- 2. Food crops with harvested parts that touch the biosolids/soil mixture and are totally above ground shall not be harvested until **14** months after application of biosolids.**

Class B Site Restrictions

for harvesting of crops and turf

- 3. Food crops with harvested parts below the land surface where biosolids remain on the land surface for 4 months or longer prior to incorporation shall not be harvested until 20 months after biosolids application.**
- 4. Food crops with harvested parts below the land surface where biosolids remain on the land surface for less than 4 months prior to incorporation shall not be harvested until 38 months after biosolids application.**

Class B Site Restrictions

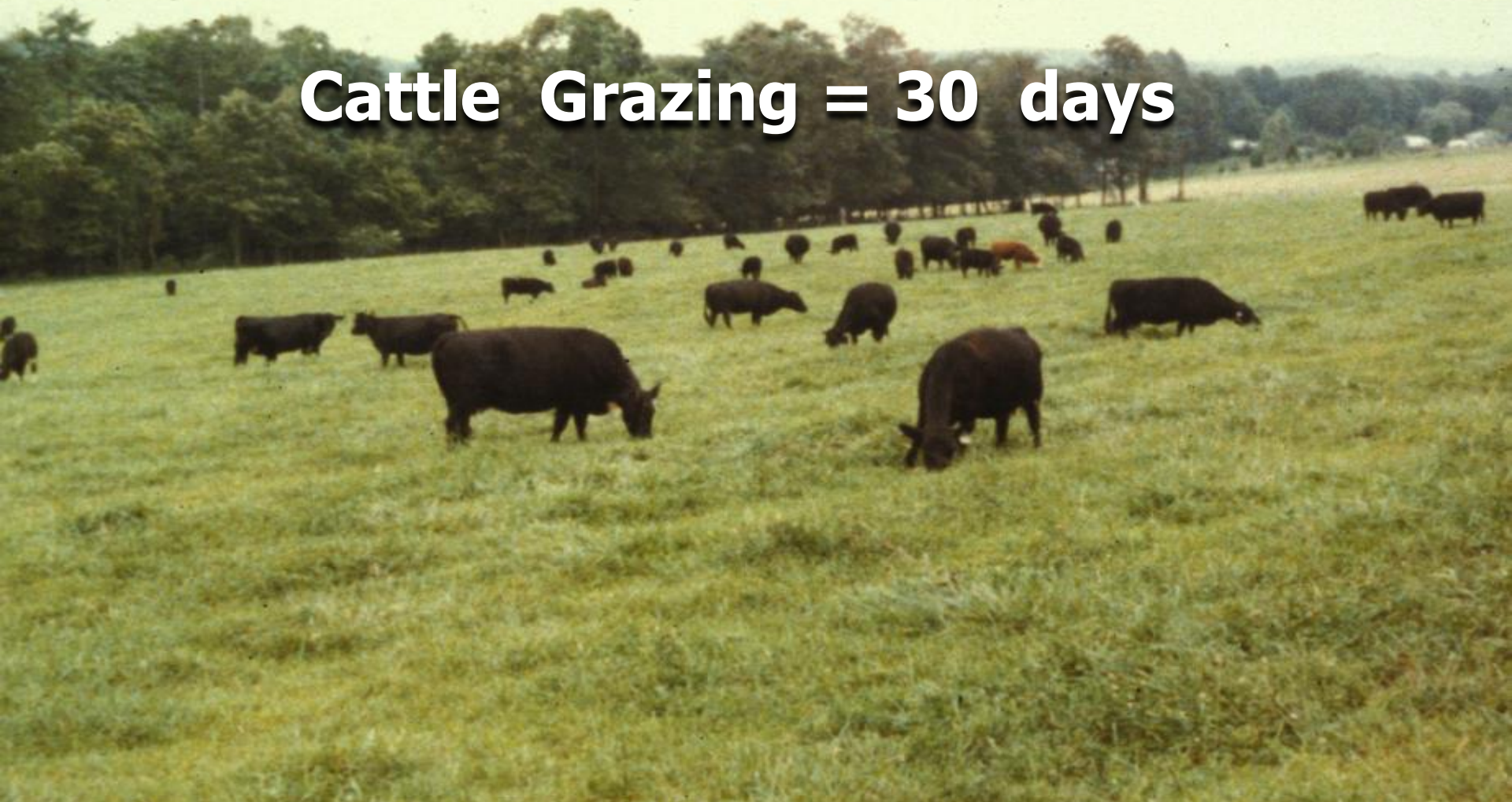
for harvesting of crops and turf

- 5. Turf grown on land where biosolids are applied shall not be harvested until **1 year** after application of the biosolids when the harvested turf is placed on either land with a high potential for public exposure or a lawn, unless otherwise specified by the permitting authority.**

Class B - Site Restrictions

Site Access and Animal Grazing

Cattle Grazing = 30 days



Class B - Site Restrictions

Ball Park = 1 year



Class B - Site Restrictions

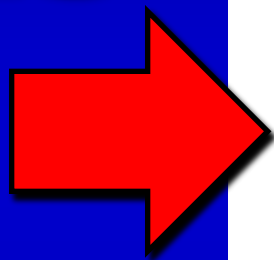
Crop Harvesting

**Could be as much as
38 months**

Exceptional Quality (EQ) Biosolids

MEETS ALL OF THE
HIGHEST QUALITY
CHAPTER 0400-40-15
STANDARDS

EQ
Biosolids
equals





under
**Tennessee
Biosolids Rules**
Chapter
0400-40-15

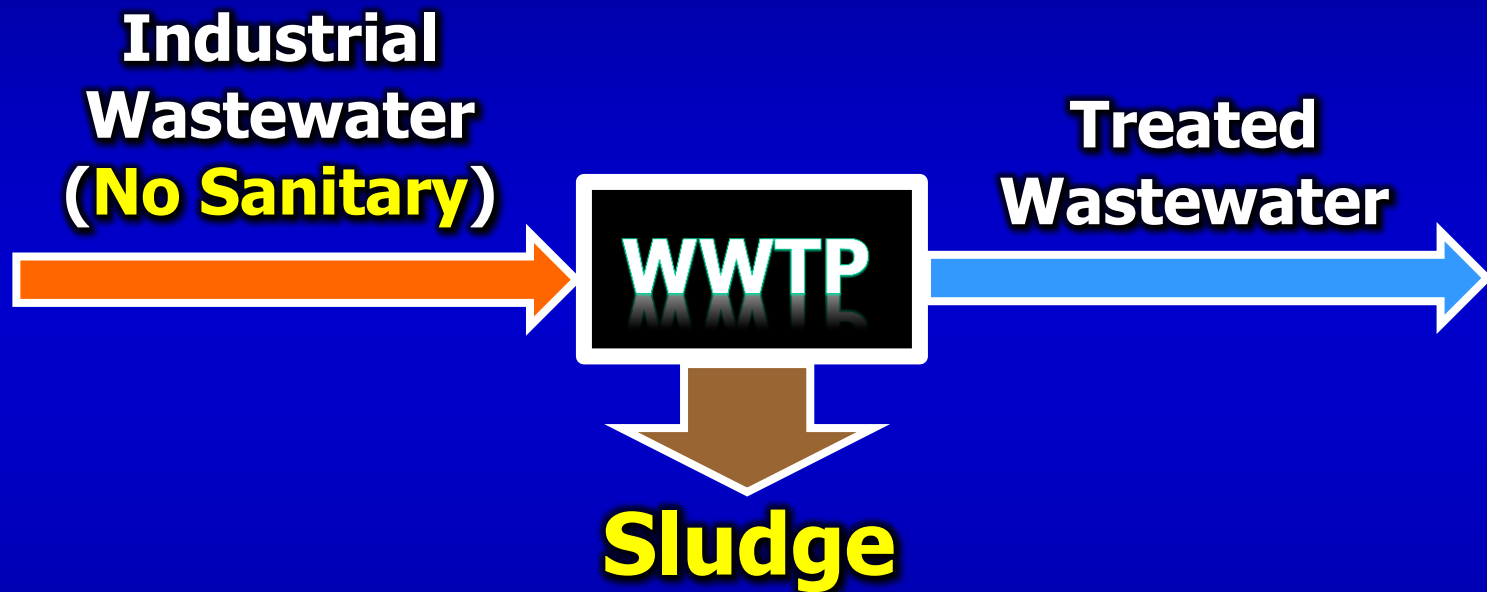
Exclusion in Part 503.6(d) Relative to Industry

Sludge generated at an industrial facility.

Part 503 does not establish requirements for the use or disposal of sludge generated at an industrial facility during the treatment of industrial wastewater, including sewage sludge generated during the treatment of industrial wastewater combined with domestic sewage.

AT AN INDUSTRIAL FACILITY

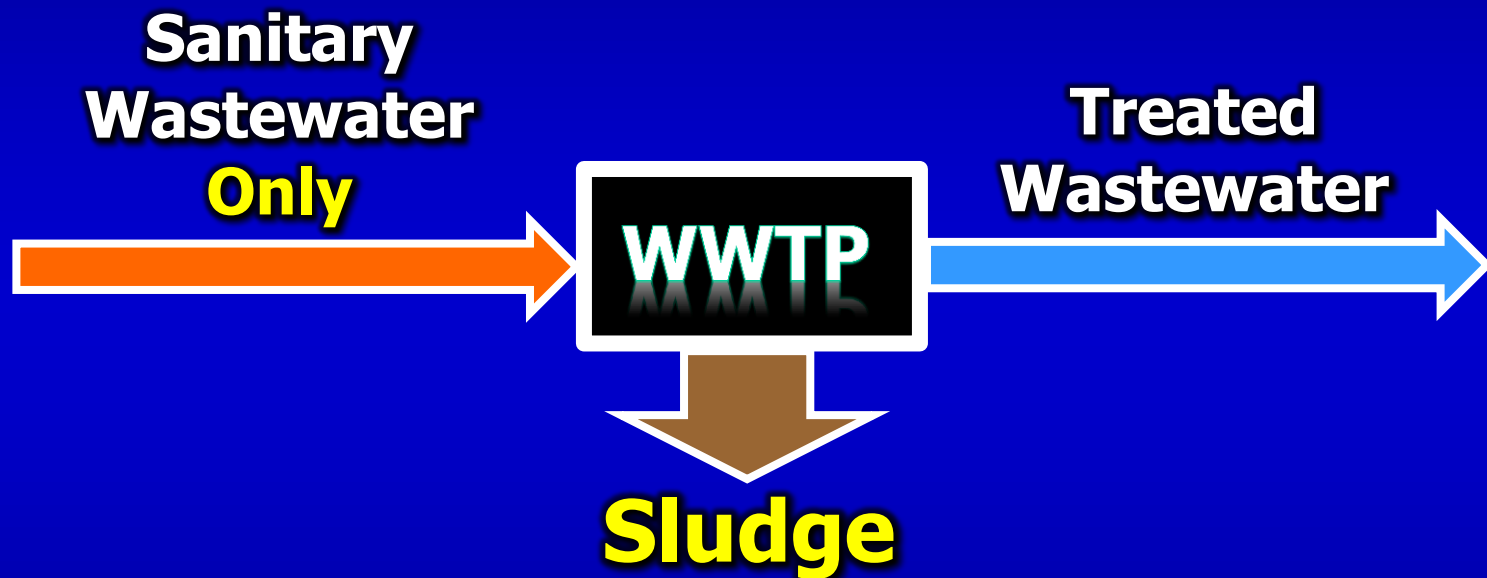
SCENARIO 1



Sludge is not sewage sludge and is regulated under Part 257.

AT AN INDUSTRIAL FACILITY

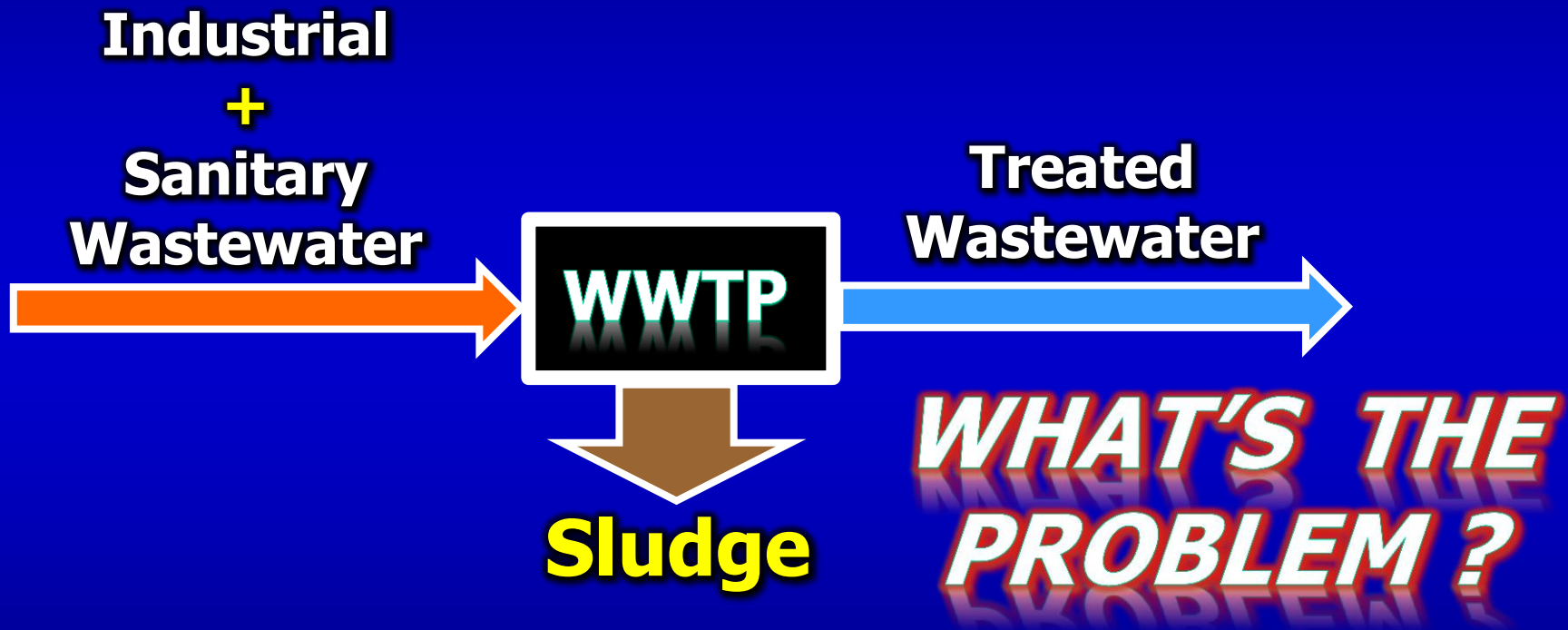
SCENARIO 2



*Sludge is sewage sludge,
and is regulated under Part 503.*

AT AN INDUSTRIAL FACILITY

SCENARIO 3



Sludge is sewage sludge, but excluded from Part 503, and is regulated under Part 257.

STATES DECIDE AUTHORITY

- *DWR Biosolids Management Rule – Adopted 503 and Exclusion for industrial sludge, commercial septage, grit and screenings, etc.*

WHAT'S THE PROBLEM?

INDUSTRIAL SLUDGE = BIOSOLIDS

- *ash – products of combustion*
- *pulp and paper residuals – product of paper manufacture*
- *water treatment residuals – product of municipal or industrial water treatment*

SLUDGE HAS VALUE!!

INDUSTRIAL SLUDGE = BIOSOLIDS

- *landfill leachate – a product of landfill operations*
- *waste lime or lime mud – product of pulp and paper processing, cement manufacture, and mining*
- *wood waste – products of forestry operations and wood processing*

SLUDGE HAS VALUE!!

INDUSTRIAL SLUDGE = BIOSOLIDS

“Unique” residuals - those that require special consideration or vary significantly between generators.

- *food production residuals (e.g. abattoir waste, mushroom compost, whey);*
- *aged wood waste*
- *dredge materials*
- *lime-based residuals*

SLUDGE HAS VALUE!!

STATE DECIDE AUTHORITY

- *Service needed for industrial generators.*
- *DWR Rule Changes to INCLUDE industrial sludge?*

DWR – NO PROBLEM!!

DWR SAYS NO!!



DSWM BENEFICIAL USE

RULE 0400-11-01-.02(1)(b)(3)(xxii)

The beneficial use of waste, which does not constitute disposal, provided that upon request of the Commissioner, the generator demonstrates to the satisfaction of the Commissioner that such use is not detrimental to public health, safety, or the environment.

TN DSWM HISTORY

Industrial food processing generators with some commercial mixes

- *Meat rendering (beef, pork & poultry)*
- *Yogurt/Dairy processing*
- *DAF skimmings, grease-traps, pond clean-outs, holding tank clean-outs, etc.*

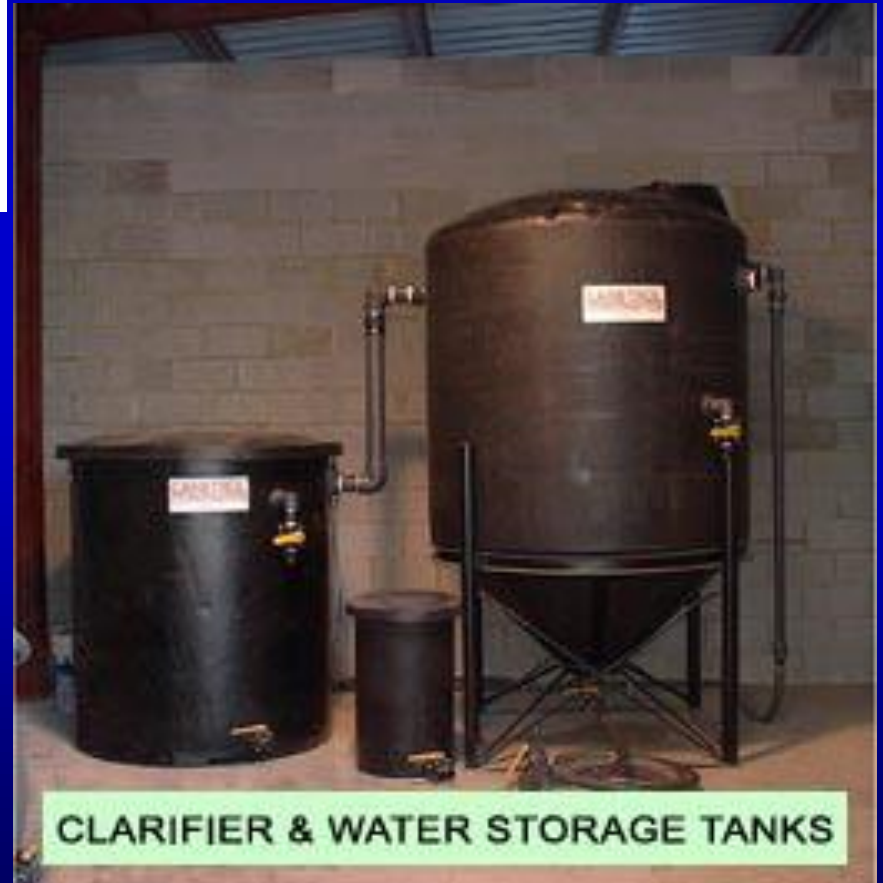
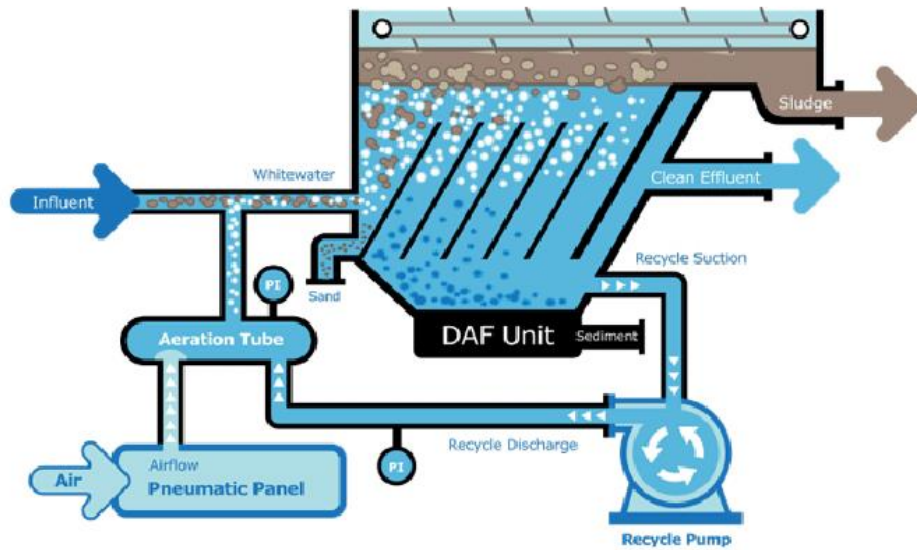


Whey Too Much: Greek Yogurt's Dark Side

Greek yogurt is a booming \$2 billion a year industry — and it's producing millions of pounds of waste that industry insiders are scrambling to figure out what to do with.

By [Justin Elliott](#) on May 22, 2013

Twice a day, seven days a week, a tractor trailer carrying 8,000 gallons of watery, cloudy slop rolls past the bucolic countryside, finally arriving at





**Grease Interceptor
Pumping Truck**





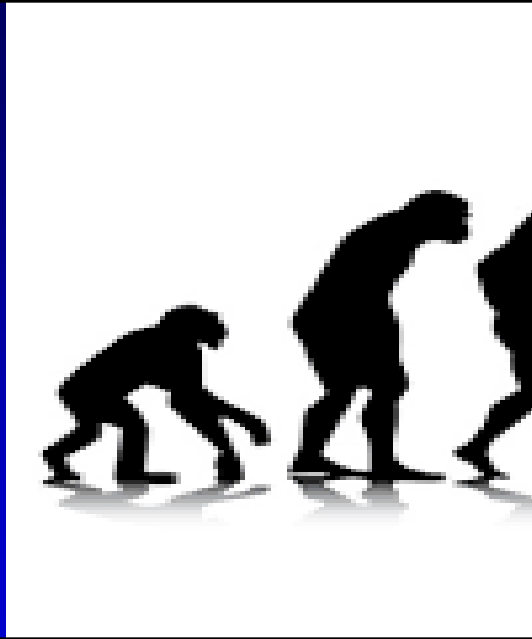
WHAT'S IN INDUSTRIAL SLUDGE ???



- *Sanitary component?*
- *Process waters?*
- *Municipal component?*
- *Stormwater*
- *All of the above?*

INDUSTRIAL SLUDGE ≠ BIOSOLIDS

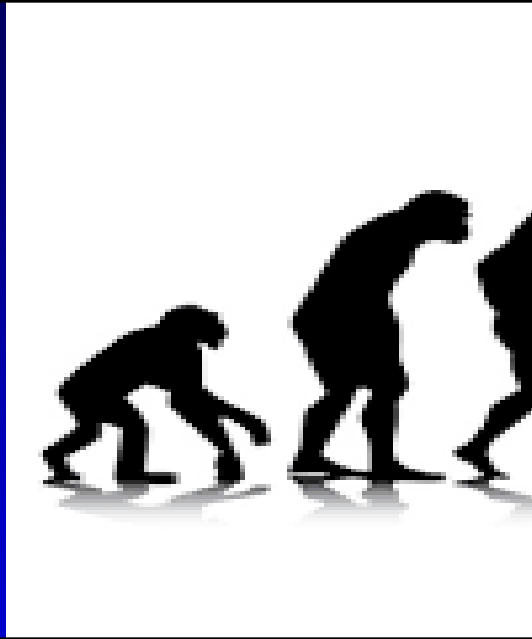
<u><i>Tennessee</i></u>	<u><i>Biosolids</i></u>	<u><i>Industrial Sludge</i></u>
<u><i>Generator</i></u>	<i>Municipal/Domestic</i>	<i>Industrial/Commercial</i>
<u><i>Regulatory Authority</i></u>	<i>DWR</i>	<i>DSWM</i>
<u><i>Basis for Performance Standards</i></u>	<i>40 CFR 503</i>	<i>40 CFR 257</i>
<u><i>Quality</i></u>	<i>Pre-Treatment</i>	<i>Demonstrate</i>
<u><i>Pathogen/Vectors</i></u>	<i>Pre-Treatment</i>	<i>Demonstrate</i>
<u><i>Typical “as-applied” Physical State</i></u>	<i>sludge – dry cake</i>	<i>liquid – sludge</i>



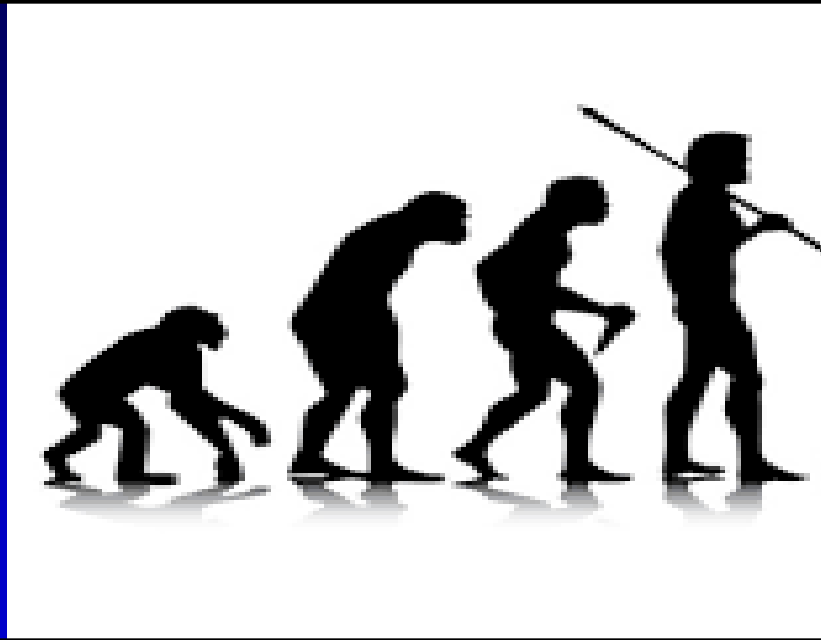
2005 - TN Rules - 0400-11-01-.13

Requirements for Land Application Facilities

- ***Solid wastes from food processing facilities = PBR***
- ***All other = BUD***

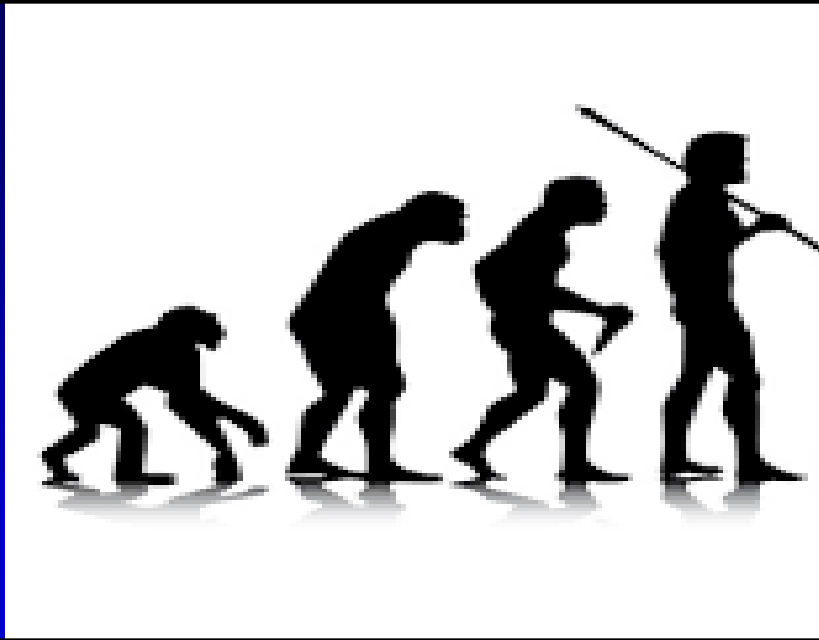


***The facility must be...operated,
...maintained, ...to minimize the
propagation, harborage...of...other
disease vectors.***



2005 DSWM Guidance

Land Application of Solid Wastes from Food Processing Facilities



PBR performance standards for land application developed MOSTLY with 40 CFR 257 requirements and NOT 40 CFR 503.

DSWM GUIDANCE 2005-2018

¶ ▪ 3e. → Disease Vectors and Pathogens ¶

There are potential sources of industrial processing sludge (such as animal and dairy processing plants), which may contain bacteria, protozoa, larva, eggs from parasitic organisms, and/or viruses. These pathogens represent a public health risk if there is a transfer into food or animal feed crops, or if these materials are transferred offsite by vectors or run-off. Pathogenic waste should be stabilized and/or disinfected prior to land application, and the effectiveness of the stabilization/disinfection process should be verified periodically through testing. Common techniques for stabilization of waste prior to land application include: ¶

- 1) → Composting, and ¶
- 2) → Lime Stabilization ¶

¶
PSRP FROM 40 CFR 257

WHAT'S THE PROBLEM ?



***Composting and
lime stabilization
are costly and
diminish the
nutrient value. ☹️***

WHAT ABOUT THE PATHOGENS ??

PATHOGENS

Most of the pathogenic bacteria, viruses, and parasites in are enteric, which means they are present in the intestinal tracts of humans AND animals.

**ARE IN
FOOD PROCESSING SLUDGE!!!**

PATHOGENS



Meat Rendering

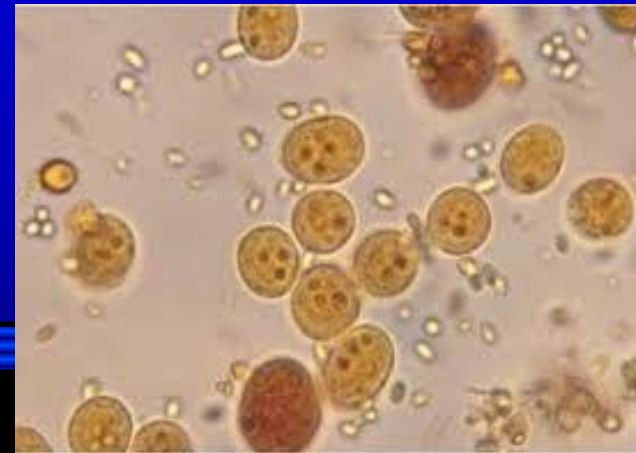
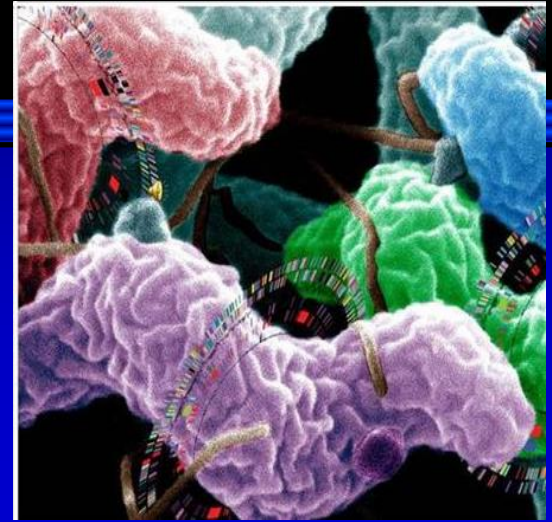
E. Coli

Salmonella

Campylobacter

Parasite eggs

Amoebic cysts



**ARE IN
FOOD PROCESSING SLUDGE!!!**

SITE RESTRICTIONS ?

- **Caution** - 40 CFR 257 provides exclusion for [industrial] sewage disposed of by trenching or burial operation. Injection or incorporation is NOT equivalent to trenching or burial.
- **Caution** – injection or incorporation and site restrictions do NOT satisfy Pathogen Reduction.

INJECTION ? INCORPORATION ?

APPLICABLE EPA GUIDANCE

1993 – 1996 NRC Review

- *EPA was just finalizing the Part 503 Rule, Standards for the Use or Disposal of Sewage Sludge*
- *A major implementation concern was with the food processing industry's reluctance to accept the practice*

APPLICABLE EPA GUIDANCE

1993 NRC WSTB Committee

- *Independent study on safety and use of [sewage] sludge for crop production.*
- *Use of Reclaimed Water and Sludge in Food Crop Production (1996)*
- *Deemed useful for FOOD PROCESSORS.....*



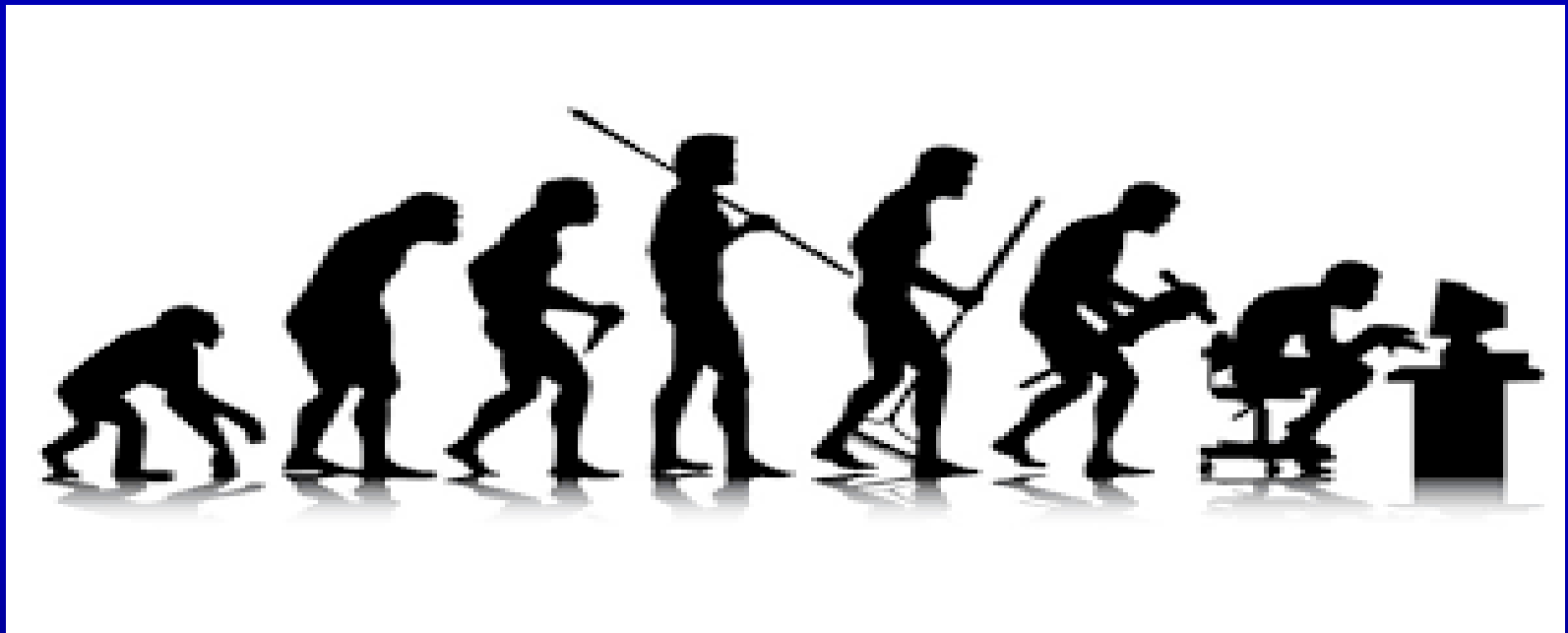
YADA YADA YADA

APPLICABLE EPA GUIDANCE

2002 EPA RESPONSE

- *Independent study on safety and use of [sewage] sludge for crop production.*
- *Use of Reclaimed Water and Sludge in Food Crop Production (1996)*
- *Deemed useful for FOOD PROCESSORS.....*

DSWM GUIDANCE **DRAFT** 2018



257 – Requires use of specific treatment technologies

503 – Flexibility with use of specific treatment or quality demonstration.

DSWM GUIDANCE **DRAFT** 2018

- Demonstrate by NPDES/POTW process flow diagram < 10% by volume sanitary component considered *de minimis* quantity for exclusion to 40 CFR 257 PSRP.
- Fecal demonstration – borrow from 40 CFR 503
 - <2,000,000 MPN/g (dry weight basis)
 - current sampling/testing guidance.

40 CFR 257 + 503

DSWM GUIDANCE DRAFT 2018

- **Site restrictions applied – borrow 40 CFR 503, Class B Biosolids**
- **Vector Attraction Reduction Requirements (40 CFR 257)**
 - **periodic application of cover material**
 - **injection/incorporation**

40 CFR 257 + 503

PATHOGENS

These enteric organisms are usually associated with self-limited gastrointestinal illness but can develop into more serious diseases in sensitive populations such as immune-compromised individuals, infants, young children, and especially the elderly.

**ARE IN
FOOD PROCESSING SLUDGE!!!**

WORKER EXPOSURE

***Class B + Site Restrictions = PUBLIC
Protection***

***Assumes natural processes to further reduce
pathogens in the sludge prior to public
access.***

5,230,000 Results

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World's first human case of H7N4 avian flu reported in China

By Mark Lieber, CNN

Updated 3:18 PM ET, Thu February 15, 2018



Source: CNN

What is bird flu? 01:12

Story highlights

The 68-year-old woman was hospitalized in January

Wild aquatic birds are the natural hosts for most influenza type A viruses

H7 virus infections in humans are not common and typically cause mild to moderate illnesses

treatment January 22.

It was not until February that the virus was identified as being of avian origin, according to a report from the Chinese Center for Disease Control and Prevention.

(CNN) — The first human case of the H7N4 strain of avian influenza has been reported in China, Hong Kong's Centre for Health Protection announced Wednesday.

A 68-year-old woman living in Jiangsu Province in eastern China, near Shanghai, had contact with live poultry before she began developing pneumonia-like symptoms December 25. She was admitted to a hospital January 1 and was discharged after successful

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Pennsylvania officials urge consumers to discard raw milk

BY CORAL BEACH | MAY 8, 2018

Consumers who have unpasteurized, raw milk from Pool Forge Dairy should immediately throw it out and monitor themselves and their children for symptoms of Listeria infection for the next 70 days.

Pennsylvania's Department of Agriculture posted the warning Monday because routine tests by the department showed the milk to be contaminated with *Listeria monocytogenes*.

"Consumers who purchased raw, whole milk from Pool Forge Dairy between April 25 and May 7 should immediately discard it. The milk was sold in a plastic quart, half-gallon, and gallon containers with the Pool Forge label," according to the notice from the agriculture department.

The dairy, which is Lancaster County, sold the implicated unpasteurized milk at the farm at 201 Bridgeville Road; Shady Maple Market at 1324 Main Street; and Hoover's Farm Market at 1719 Main Street. All three locations are in East Earl Township in northeastern Lancaster County.

It can take up to 70 days after exposure for symptoms of Listeria infection to develop. Called listeriosis, the infection is particularly dangerous for young children, the elderly, pregnant women and anyone else with an underdeveloped or compromised immune system.

In high-risk groups, particularly young children and people older than 65, the infection can quickly lead to life-threatening complications and death.



GLOBAL HEALTH

Bologna Blamed in Worst Listeria Outbreak in History



In early March, Enterprise Foods issued a recall of some processed meat products in South Africa, where a yearlong, deadly listeria outbreak was finally traced to a type of bologna. Sipiwe Sibeko/Reuters

By Emily Baumgaertner

March 30, 2018

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To protect public health, the EPA's 40 CFR Part 503 rule prescribes a restricted period of up to 1 year to limit public access to lands where Class B biosolids have been applied. These EPA restrictions do not apply to occupational access. EPA does recognize that occupational exposure can occur and states that workers exposed to Class B biosolids might benefit from several additional precautions such as use of dust masks when spreading dry materials, the use of gloves when touching biosolids, and routine hand washing before eating, drinking, smoking, or using the bathroom. The risk of worker exposure to infectious agents in Class B biosolids is likely greatest prior to, during, and immediately after land application of the biosolids. Because the concentration of pathogens declines through natural processes, the potential for pathogen exposure decreases over time.